IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re:	Dale C. Flanders *et al.*	Confirmation No:	4350
Application No:	09/645,827	Group:	1793
Filed:	August 25, 2000	Examiner:	Aboagye, Michael
For:	Optical System Production System		
Customer No.:	25263		
Attorney Docket No.	1000.0006		

APPELLANT'S BRIEF

Commissioner for Patents
P.O. Box 1450,
Alexandria, Virginia 22313-1450

Sir:

This is the Applicants' appeal from the final Office Action, mailed December 28, 2007 (Paper No. 20071219).

Real Party in Interest

Axsun Technologies, Inc. is the real party in interest.

Related Appeals and Interferences

There are no related appeals or interferences.

Status of Claims

Claims 1, 3-8, 17, 19, and 20 are pending in this application. Claims 2, 9-16 and 18 are cancelled. Claims 1, 3-8, 17, 19, and 20 are rejected. The rejection of claims 1, 3-8, 17, 19, and 20 is being hereby appealed.

Status of Amendments

All amendments have been entered. There were no post final amendments or proposed amendments.

Summary of Claimed Subject Matter

Claim 1 concerns an optical system production line, comprising

an optical bench supply that provides optical benches (see specification at page 25, line 19, and Fig. 26, reference numeral 2018);

a component supply that provides mounting structures holding optical components (see specification at page 25, line 5, and Fig. 26, reference numerals 2010, 2012);

a pick-and-place machine that receives optical benches from the bench supply, picks optical components from the optical component supply, and solder bonds the mounting structures, holding the optical components, to the optical benches (see specification at page 25, line 8, and Fig. 26, reference numeral 2014); and

optical system aligner that characterizes the positions of the optical components held by the mounting structures, which have been solder bonded to the optical benches by the pick-and-place machine, and mechanically adjusts the relative positions of the optical components by plastically deforming the mounting structures, which have been bonded to the optical benches by the pick-and-place machine (see specification at page 25, line 26, and Fig. 26, reference numeral 2020).

Claim 17 concerns an optical system production line, comprising

an optical bench supply for providing optical benches (see specification at page 25, line 19, and Fig. 26, reference numeral 2018);

a component supply for providing mounting structures holding optical components (see specification at page 25, line 5, and Fig. 26, reference numerals 2010, 2012);

a pick-and-place machine for receiving optical benches from the bench supply, and for picking optical components from the optical component supply, and for solder bonding mounting structures of the optical components to the optical benches (see specification at page 25, line 8, and Fig. 26, reference numeral 2014); and

means for characterizing the positions of the optical components held by the mounting structures, which have been solder bonded to the optical benches by the pick-and-place machine, and for mechanically adjusting the relative positions of the optical components by plastically deforming the mounting structures that have been bonded to the benches by the pick-and-place machine (corresponds to optical system aligner or alignment system 2020, see specification at page 25, line 26, and Fig. 26, reference numeral 2020).

Grounds of Rejection to be Reviewed on Appeal

I. Whether claims 1 and 3-8 are unpatentable under 35 USC 103(a) over Wolfgang (SPIE Vol. 2906, Microrobotics: Components and Applications), hereinafter Wolfgang, in view of Haake *et al.* (US Patent No. 5,870,518), hereinafter Haake.

II. Whether claims 17, 19 and 20 are anticipated under 35 USC 102(b) by Wolfgang.

Argument

It is well settled that the Examiner bears the initial burden of establishing a prima facie case. In re Oetiker, 977 F.2d 1443, 1445 (Fed. Cir. 1992). To establish a prima facie case of obviousness, all the claim features must be taught by the prior art. In re Royka, 490 F.2d 981, 985 (CCPA 1974). If examination at the initial stage does not produce a prima facie case of unpatentability, then without more the applicant is entitled to a grant of the patent. Oetiker, 977 F.2d at 1445.

Claims 1 and 3-8 are patentable Wolfgang in view of Haake

Claim 1 is distinguishable over the combination of Wolfgang and Haake on two points. First neither Wolfgang nor Haake shows nor suggests the use of a pick-and-place machine for first solder bonding components to the benches followed by an aligner characterized component positions and then mechanically adjusts those components. Secondly, neither of the applied references discloses an optical system aligner that plastically deforms the bench-bonded components.

Wolfgang article discloses a system in which the UTH's are placed on a bench with a gripper, as illustrated in its Fig. 8A, with a robot. The UTH's are then fine positioned until they are properly aligned in the optical link. See Fig. 8B of Wolfgang. Only then are the UTH's attached to the optical bench as shown in the Fig. 8C of Wolfgang by the robot.

In short, the Wolfgang does not use: 1) a pick and place along with an optical system aligner, or 2) an optical system aligner that plastically deforms the bench-bonded components.

The pending Office Action argues that certain language in Wolfgang is suggestive of the claimed operation of the present invention. Specifically, the pending Office Action at page 3 argues:

> (see, section 5.3). Note the examiner interprets conducting active **compensation** of component misalignment to mean adjustment made after the component has been bonded. Note again that the examiner interpretation is made with more emphasis on the meaning of **compensatory.** The examiner reminds the applicant that these conclusions

Applicants respectfully disagree with this argument. The use of the word "compensation" would not connote some special functionality and certainly not functionality different from that disclosed in the clear language of Wolfgang. In short, there is nothing in Wolfgang that suggests any operation other than that disclosed: positioning of the UTH's followed by their laser welding.

The advantage of the present invention relative to the system disclosed in the Wolfgang is that in some applications, the present invention can achieve sub-micron alignment accuracies with very high yields. This would be difficult to achieve using the Wolfgang process, in the opinion of the inventors, with current technology. This is because the laser welding step can distort the alignment due to the concomitant temperature cycling. In contrast, with the present invention, the alignment is performed after attachment.

For these reasons, withdrawal of this rejection is also warranted since there is no prima facie obviousness.

Claims 17, 19 and 20 are patentable over Wolfgang

Claim 17 is distinguishable over Wolfgang on two points. First, Wolfgang does not show the use of a pick-and-place machine combined with separate means for characterizing and mechanically adjusting. Secondly, Wolfgang does not describe means for mechanically adjusting that plastically deforms the bench-bonded components.

Wolfgang article discloses a system in which the UTH's are placed on a bench with a gripper, as illustrated in its Fig. 8A, with a robot. The UTH's are then fine positioned until they are properly aligned in the optical link. See Fig. 8B of Wolfgang. Only then are the UTH's attached to the optical bench as shown in the Fig. 8C of Wolfgang by the robot.

In short, the Wolfgang does not teach 1) the use of a pick and place along with characterizing and adjusting means, nor 2) adjustment means that plastically deforms the bench-bonded components.

For these reasons, withdrawal of this rejection is also warranted since there is no anticipation.

For the foregoing reasons, Applicants believe that the pending rejections should be withdrawn, and that the present application should be passed to issue. Should any questions arise, please contact the undersigned.

Respectfully submitted,

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Date: October 27, 2008

Claims Appendix

Listing of Claims

1. (Previously presented) An optical system production line, comprising
an optical bench supply that provides optical benches;
a component supply that provides mounting structures holding optical components;
a pick-and-place machine that receives optical benches from the bench supply, picks optical components from the optical component supply, and solder bonds the mounting structures, holding the optical components, to the optical benches; and
optical system aligner that characterizes the positions of the optical components held by the mounting structures, which have been solder bonded to the optical benches by the pick-and-place machine, and mechanically adjusts the relative positions of the optical components by plastically deforming the mounting structures, which have been bonded to the optical benches by the pick-and-place machine.

2. (Cancelled)

3. (Previously presented) An optical system production line as claimed in claim 1, wherein the optical system aligner characterizes the positions of the optical components by activating optical links of optical systems on the benches, detecting optical signals after interaction with at least some of the optical components and adjusts the optical components to optimize transmission of optical signals over the links.

4. (Previously presented) An optical system production line as claimed in claim 1, wherein the optical system aligner energizes active components of optical

systems on the benches and adjusts the optical components, which have been bonded to the optical benches by the pick-and-place machine, to optimize optical signal transmission through the systems from the active optical components.

5. (Previously presented) An optical system production line as claimed in claim 1, wherein the optical system aligner energizes active components of optical systems and adjusts positions of at least one passive optical component, which have been bonded to the optical benches by the pick-and-place machine, in each of the optical systems to optimize optical signal transmission from the active components to the at least one passive component.

6. (Previously presented) An optical system production line as claimed in claim 1, wherein the optical system aligner energizes active components of optical systems and adjusts positions of at least two passive optical components, which have been bonded to the optical benches by the pick-and-place machine, in each of the optical systems to optimize optical signal transmission between the passive components.

7. (Original) An optical system production line as claimed in claim 1, wherein the pick and place machine is a flip-chip bonder.

8. (Previously presented) An optical system production line as claimed in claim 1, wherein the optical system aligner comprises two jaws for engaging the mounting structures, which has been bonded to the optical benches by the pick-and-place machine, supporting the optical component and moving the structures relative to the bench.

Claims 9.-16. (Cancelled)

17. (Previously presented) An optical system production line, comprising
an optical bench supply for providing optical benches;
a component supply for providing mounting structures holding optical components;

a pick-and-place machine for receiving optical benches from the bench supply, and for picking optical components from the optical component supply, and for solder bonding mounting structures of the optical components to the optical benches; and

means for characterizing the positions of the optical components held by the mounting structures, which have been solder bonded to the optical benches by the pick-and-place machine, and for mechanically adjusting the relative positions of the optical components by plastically deforming the mounting structures that have been bonded to the benches by the pick-and-place machine.

18. (Cancelled)

19. (Previously presented) An optical system production line as claimed in claim 17, further comprising the characterizing and adjusting means characterizing the positions of the optical components by activating optical links of optical systems on the benches, detecting optical signals after interaction with at least some of the optical components, and adjusting the optical components, which have been bonded to the optical benches by the pick-and-place machine, to optimize transmission of optical signals over the links.

20. (Previously presented) An optical system production line as claimed in claim 17, further comprising the characterizing and adjusting means energizing active components of optical systems and adjusting positions of at least one passive optical component, which has been bonded to the optical benches via a mounting structure by the pick-and-place machine, in each of the optical systems to optimize optical signal transmission from the active components to the at least one passive component.

Evidence Appendix

None

Related Proceedings Appendix

None